

NOTE

Observation with the Scanning Electron Microscope of a
Fly Captured in Amber

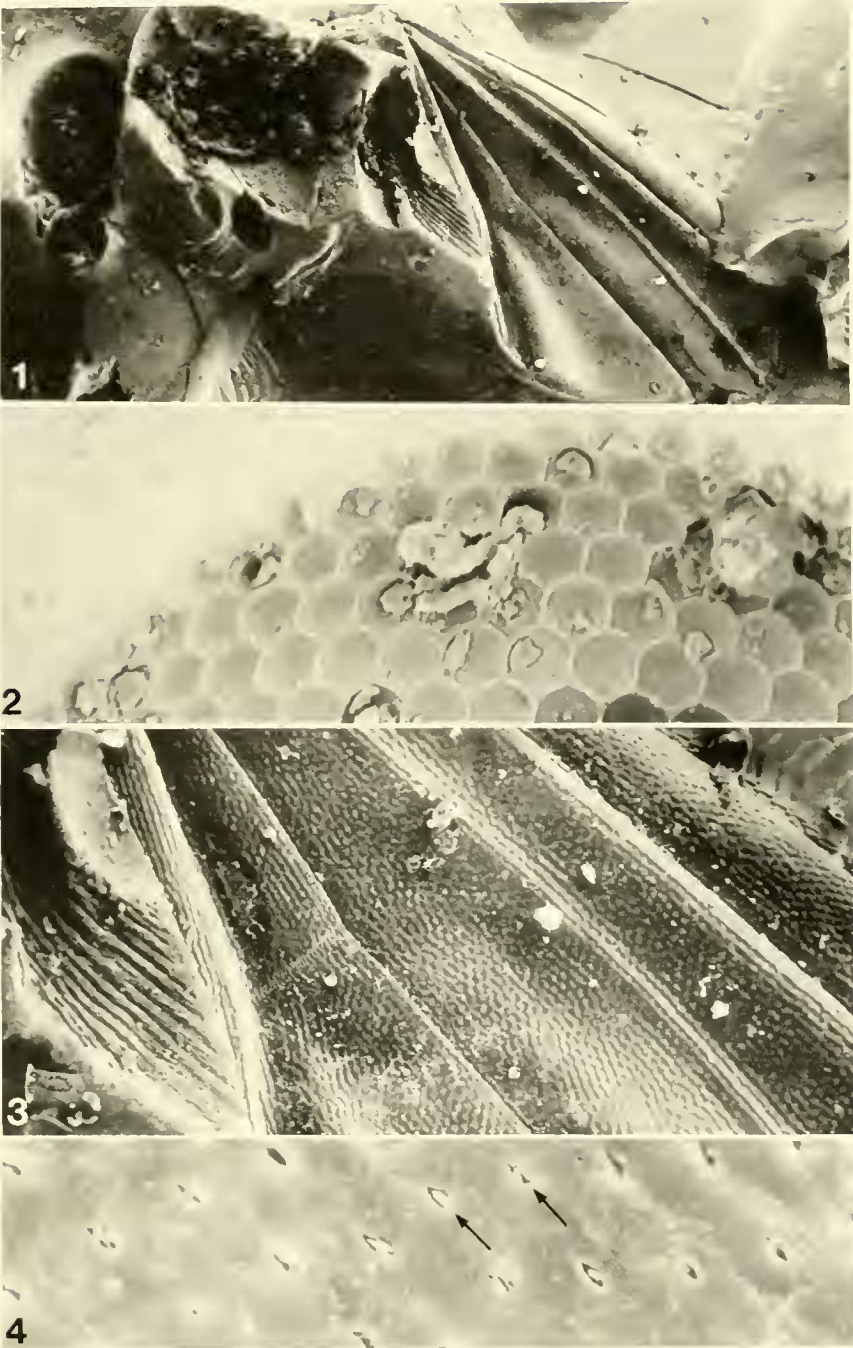
Amber is a fossil plant resin which originated as a secretion from trees and appears in the fossil record as early as the carboniferous but is more common in Cretaceous and Tertiary strata (Langenheim, 1969. *Science* 163: 1157-1169). Succinite is the most common amber found in northern Europe in Oligocene deposits and also is cast up on the shores of the Baltic Sea. It possibly was secreted from a species which had affinities to the Pinaceae and the Araucariaceae but which is no longer extant (Langenheim, 1969). The plant and animal inclusions in Baltic amber have been described in numerous publications. Larsson (1978. *Baltic Amber—a Paleobiological Study*. Scandinavian Science Press Ltd., Klampenborg, Denmark) in his extensive bibliography cites more than forty publications by Meunier on insect inclusions published between 1892 and 1923. Most descriptions are based on light microscope studies of polished pieces of clear amber. The present note suggests that amber fragments may on occasion be profitably studied with the scanning electron microscope.

Often pieces of amber show a laminated structure which may have resulted from successive resin flows, and often insects were trapped on the surface of one flow and covered by a subsequent flow (Larsson, 1978). This lamination allows the amber to be fractured along an interface and thus expose the remains of an organism or the imprint it left in the solidifying resin. Small segments were split away from a 2 cm³ piece of Baltic amber with the aid of a razor blade. A fragment that contained the impression of a fly was glued to a stub and coated with a 200 Å thick layer of gold palladium (four thirty second bursts from a Balzers Union sputter coater) and photographed with a scanning electron microscope (AMR model 1000A). Figs. 1-4 show the impression that the fly made in the solidifying amber. Details of the compound eye and wing are shown at higher magnifications (Figs. 2-4). The small "holes" in the wing are probably the impression of hairs and at higher magnification a broken hair ("cross section") is seen in each hole (Fig. 4). From the micrographs, E. R. Hoebeke, J. K. Liebherr and Q. D. Wheeler (Department of Entomology, Cornell University) suggested that the fly is a member of the Dolichopodidae. Larsson (1978) notes that living members of this family are often encountered in large numbers in low vegetation where high humidity prevails and are also extensively represented as inclusions in Baltic amber.

It may be rewarding to study fragments of amber for other small inclusions especially small insects, mites, spores and pollen grains with the scanning electron microscope.

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Figs. 1-4. Scanning electron micrographs of impression of fly in amber. 1, Impression with some organic (?) material $\times 32$. 2, Part of compound eye $\times 530$. 3, Part of wing $\times 105$. 4, Cross sections of wing hairs (arrows) embedded in amber $\times 1050$.